

common plantain

Plantago major L.

Synonyms: *Plantago asiatica* auct. non L., *Plantago halophila* Bickn., *Plantago major* L. ssp. *intermedia* (DC.) Arcang., *Plantago major* L. var. *asiatica* auct. non (L.) Decne., *Plantago major* L. var. *intermedia* (DC.) Pilg., *Plantago major* L. var. *pachyphylla* Pilg., *Plantago major* L. var. *pilgeri* Domin, *Plantago major* L. var. *scopulorum* Fr. & Broberg

Other common name: broadleaf plantain, buckhorn plantain, great plantain, rippleseed plantain

Family: Plantaginaceae

Invasiveness Rank: 44 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

Common plantain is an annual, biennial, or perennial plant with a thick rootstalk and extensive, fibrous roots. Roots can spread up to 91 cm deep and wide. Flowering stalks can grow up to 61 cm tall, but are generally 15 to 20 cm tall. Common plantain is hairless, except for a few hairs on the undersides of leaves. Leaves form basal rosettes. They are 5 to 30 ½ cm long, up to 10 cm wide, strongly three- to five-ribbed, petiolated, and ovate to cordate with smooth margins. Flowers are borne in spikes on one to many leafless stalks. Flowers are numerous, small, 2 to 4 mm in diameter, and green-white. They fade to brown with age. Flowers are self-compatible and are pollinated by wind and flies. Fruits are ovate capsules that split around the middle with 5 to 30 seeds each. Seeds are brown-black, small, and elliptic to four-sided (Sagar and Harper 1964, Royer and Dickinson 1999). This species has very variable morphology. Many subspecific forms have been recognized (Sagar and Harper 1964).

Similar species: Six other *Plantago* species are known from Alaska, four of which are native. *Plantago major* can be easily distinguished from all other *Plantago* species by the presence of broad, nearly hairless leaves and more than 5 seeds per capsule.

Ecological Impact

Impact on community composition, structure, and interactions: In Alaska, common plantain integrates into highly disturbed habitats that have low interspecific competition (M.L. Carlson and I. Lapina – pers. obs.). Infestations in cultivated fields are known to reduce the growth of corn and oats (Manitoba Agriculture and Food 2002). This species is an alternate host for a number of viruses. It serves as larval food for many species of butterflies and leaf miners (Sagar and Harper 1964).

Impact on ecosystem processes: Common plantain is an early pioneer species, and it may alter successional regimes.



Plantago major L.

Biology and Invasive Potential

Reproductive potential: Common plantain reproduces by seeds and root fragments. A single plant can produce up to 14,000 seeds. Seeds can remain viable in soil for up to 60 years (Rutledge and McLendon 1996, Royer and Dickinson 1999).

Role of disturbance in establishment: Common plantain readily establishes in disturbed areas. In Alaska, plants often reappear on sites that have been disturbed years

after a previous disturbance (Densmore et al. 2001).

Potential for long-distance dispersal: Seeds are sticky when wet. They can adhere to soil particles, feathers, fur, skin, or vehicles (Rutledge and McLendon 1996, Royer and Dickinson 1999).

Potential to be spread by human activity: Common plantain travels widely with humans. Seeds can be spread by vehicles, contaminated topsoil, and contaminated commercial seed (Hodkinson and Thompson 1997).

Germination requirements: Common plantain has high variation in dormancy length. Some seeds germinate in early spring, but many germinate later in the growing season. Seeds require light for germination. Germination rates between 60% and 90% are common (Palmlblad 1968, Rutledge and McLendon 1996).

Growth requirements: This species occupies a wide range of soils including clay, loam, and sand with pH levels between 4.8 and 7.3. It is resistant to trampling and can withstand temperatures as low as -39°C. It requires 85 frost-free days for successful growth and reproduction. Common plantain can grow in infertile soil and is somewhat tolerant of shade (Rutledge and McLendon 1996, USDA 2002).

Congeneric weeds: *Plantago aristata*, *P. coronopus*, *P. firma*, *P. lanceolata*, *P. media*, *P. patagonica*, and *P. psyllium* are known to occur as non-native weeds in North America (Royer and Dickinson 1999, Whitson et al. 2000, USDA 2002). *P. aristata* and *P. lanceolata* are both considered noxious weeds in several states of the U.S. (Invaders 2010).

Legal Listings

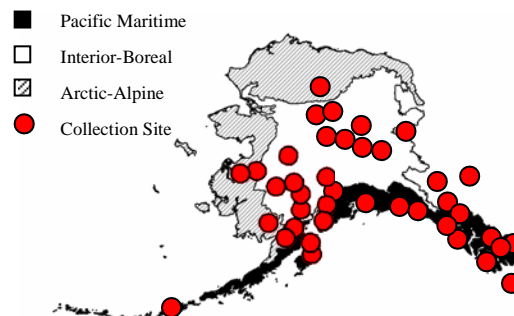
- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states (CT)
- Federal noxious weed
- Listed noxious in Canada or other countries (QC)

Distribution and Abundance

Common plantain is a common weed in cultivated

fields, lawns, roadsides, and waste areas. It can be found in open woods, valleys, and mid-montane sites.

Native and Current Distribution: Many experts believe that common plantain originated in Europe (Hultén 1968, Dempster 1993, Whitson et al. 2000) but is now cosmopolitan in its distribution. According to USDA Plants Database and ITIS (2003), however, common plantain is native to Alaska, Hawaii, and the continental U.S. Hitchcock and Cronquist (1973) recognized a native variety (*Plantago major* var. *pachyphylla*), which grows in saline habitats, and introduced variety (*P. major* var. *major*). Further studies using molecular and morphological markers and paleoecological methods are necessary to identify the patterns of nativity of this species in Alaska. Common plantain has been reported from all three ecogeographic regions of Alaska and has been found within 200 km of the arctic tree line (Hultén 1968, Densmore et al. 2001, University of Alaska Museum 2003).



Distribution of common plantain in Alaska

Management

Common plantain can be pulled with relative ease, although several weedings may be necessary to eliminate plants that germinate from buried seeds or resprout from root fragments. It can be easily controlled by herbicides (Rutledge and McLendon 1996, Densmore et al. 2001).

References:

- AKEPIC database. Alaska Exotic Plant Information Clearinghouse Database. 2010. Available: <http://akweeds.uaa.alaska.edu/>
- Alaska Administrative Code. Title 11, Chapter 34. 1987. Alaska Department of Natural Resources. Division of Agriculture.
- Dempster, L. T. 1993. Plantaginaceae in J. C. Hickman (ed.) The Jepson manual: higher plants of California. University of California Press, Berkeley, California. Pp. 1400.
- Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest. An illustrated manual. University of Washington Press. 730 pp.
- Hodkinson, D., K. Thompson. 1997. Plant dispersal: the role of man. *Journal of Applied Ecology*, 34: 1484-1496.
- Hultén, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA. 1008 p.
- Invaders Database System. 2010. University of Montana. Missoula, MT. <http://invader.dbs.umt.edu/>
- ITIS. 2010. Integrated Taxonomic Information System. <http://www.itis.gov/>

- Manitoba Agriculture and Food. 2002. Pest Management – Weeds – Broad-leaved plantain. <http://www.gov.mb.ca/agriculture/crops/weeds/fab60s00.html>
- Palmblad, I.G. 1968. Competition in experimental populations of weeds with emphasis on the regulation of population size. *Ecology*. 49(1): 26-34.
- Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
- Rutledge, C.R., and T. McLendon. 1996. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science. Colorado State University. 97pp. Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/plants/explant/index.htm> (Version 15Dec98).
- Sagar, G. R., and J. L. Harper. 1964. *Plantago major* L., *P. media* L. and *P. lanceolata* L. *Journal of Ecology* 52:189-122.
- University of Alaska Museum. University of Alaska Fairbanks. 2003. <http://hispidamuseum.uaf.edu:8080/home.cfm>
- USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- Whitson, T. D., L. C. Burrill, S. A. Dewey, D. W. Cudney, B. E. Nelson, R. D. Lee, R. Parker. 2000. Weeds of the West. The Western Society of Weed Science in cooperation with the Western United States Land Grant Universities, Cooperative Extension Services. University of Wyoming. Laramie, Wyoming. 630 pp.